

91

SANITARY SUGGESTIONS

ON

HOW TO DISINFECT OUR HOMES.

A
Résumé of
the Latest and
Best Information on the
Household Use of Disinfectants, Deodorants, and
Antiseptics, and of Practical Precautions
Preventive of Cholera, Diphtheria,
Scarlet Fever, and other
Infectious Diseases.

Prepared for Popular Perusal

BY

B. W. PALMER, A.M., M.D.

Price 10 Cents.

THE MONTREAL NEWS CO.
MONTREAL.

THE TORONTO NEWS CO.
TORONTO.

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■ Directions for use of "RED-CROSS" Ozonized
Fluid.
See page 28

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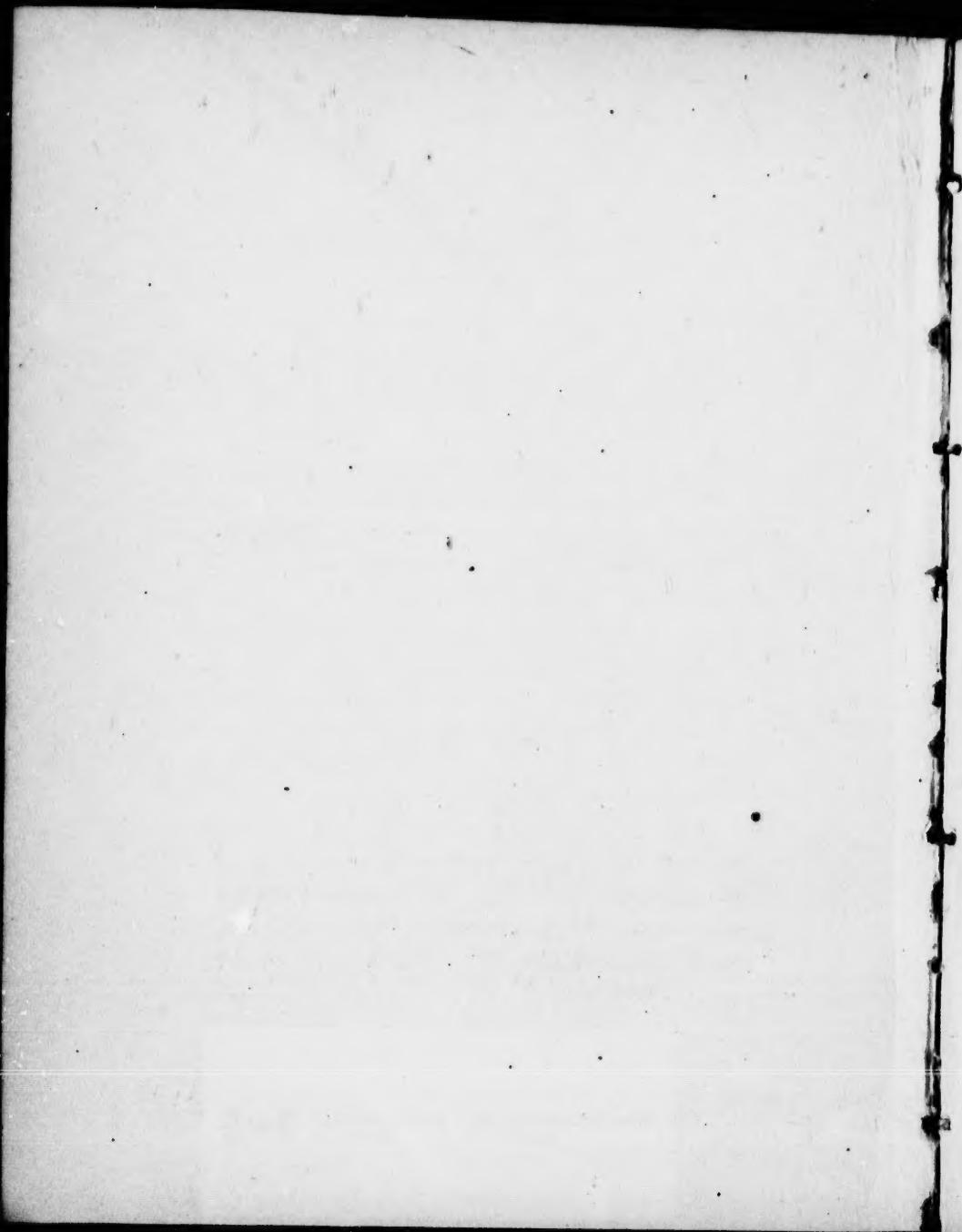
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PREFACE.

Perhaps no fact is more firmly established in the popular mind than that conveyed by the time-worn adage "an ounce of prevention is worth a pound of cure," and yet how few there are who really appreciate its significance when applied to the prevention of disease, until they are face to face with the dangers of an epidemic such as cholera, or perhaps menaced by the more immediate peril of infectious disease in their own home circle.

At no previous period in the world's history has there been concentrated on the *Prevention* of disease so much careful study and painstaking investigation as at the present time, and the results are apparent in the increased knowledge we now have as to the best methods of preventing the development of infectious diseases, or, when once originated, of reducing the possibility of their further spread to a minimum.

To briefly present the most approved agents for the prevention of infectious diseases, point out the necessity for their use, and explain their application so that any one of ordinary intelligence may be able to efficiently use them in the household, is the object of this little *brochure*.

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THE GERM THEORY.

It may not be uninteresting before presenting the facts we have to offer regarding disinfectants to briefly allude to that theory of the origin and propagation of infectious diseases now widely accepted as the most tenable, viz., the Germ Theory, inasmuch as an appreciation of the manner in which disease is originated and spread will make clearer the rationale of its prevention by disinfectants.

The Germ Theory of disease assumes that infectious diseases depend for their existence and power of infection on the development of micro-organisms (microbes of Pasteur), variously called micrococci, bacilli, bacteria, spores, etc., the life and growth of which are favored by bad hygiene and unsanitary surroundings.

Though it has not as yet been scientifically demonstrated that all infectious diseases are caused by the invasion of the body of the sick person by living germs, it has been proved in so many diseases of this class that it is highly probable it is true for all.

These germs, although not visible to the unassisted vision of the ordinary observer, may exist in the air, or in fluid or solid food, and it is by these avenues of communication that they chiefly gain access to the system.

The necessity, therefore, for pure air, food and drink, is apparent, and these are to be secured by thorough ventilation of the rooms we live in, careful exclusion of our food from possible sources of contamination, and improvement of our sanitary surroundings, by appropriate means, which it is the purpose of this *brochure* to describe.

MEASURES TO BE TAKEN TO PERFECT THE SANITARY SURROUNDINGS OF OUR HOMES.

THE methods of guarding against preventable diseases in the household are substantially those which public health associations adopt for the protection of the state. They are, in brief, general sanitation, by which is meant municipal and personal cleanliness, and disinfection.

Under general sanitation we may class all measures which have for their object the destruction of filth and all decomposing organic material, by which the development or growth of disease germs might be favored. If not practicable to destroy material of this kind it should at least be removed to a safe distance from the house and treated with disinfectants and antiseptics.

That pure air, pure food, and good hygiene are essential to the maintenance of health are facts that need scarcely be alluded to here. The vital question we have to deal with is *how* shall disease germs, once they have been developed, be killed?

It is in the accomplishment of this purpose that the beneficent action of disinfectants is made apparent.

WHAT IS A DISINFECTANT?

Not a little confusion exists in the popular mind, and indeed not a little has existed until the past three or four years in the minds of physicians and even sanitarians, as to what really constituted a disinfectant.

Many look upon the terms disinfectant, deodorant, and antiseptic as synonymous, while, as a matter of fact, their meaning is widely different, and the recognition of this difference is essential to the proper and safe employment of these three kinds of agents, which each have their role to play in combating the army of germs that, unseen, except by their dire effects, are constantly waging war against the forces of health.

The Committee on Disinfectants of the American Public Health Association, whose recent experiments have done much to dispel popular illusions regarding the nature and utility of the various agents of this class, define a disinfectant to be *an agent capable of destroying the infective power of infectious material.*

Thus, the term disinfectant signifies a germicide, a germ-killer.

Popularly, the destruction of bad odors or the arrest of putrefaction is wrongly supposed to constitute disinfection, and any agent which neutralizes or disguises the odors arising from putrefying material is regarded as a disinfectant.

DEFINITION OF DEODORANT.

In reality, however, agents which simply mask unpleasant odors should properly be called deodorants or deodorizers, and, while they serve an admirable purpose, their purpose is not the destruction of disease germs.

DEFINITION OF ANTISEPTIC.

So, also, agents which have the power to arrest the process of putrefaction, although their value in the economy of health and the prevention of disease is unquestioned, are properly termed antiseptics, and should not be regarded as disinfectants.

Dr. Geo. M. Sternberg, who has lately published some interesting articles on this subject embodying practical deductions drawn from recent experiments, very pertinently states in this connection that "a disinfectant may be both a deodorant and antiseptic, but it is not for this reason a disinfectant, but because of its ability to neutralize the infecting power of infectious material. Such material is given off from the bodies of patients suffering from small-pox or scarlet fever; it is contained in the alvine discharges of typhoid fever and cholera patients; it is present in the sputa of those suffering from tuberculosis, diphtheria, etc."

RESUME OF RESULTS OF RECENT RE-
SEARCHES OF THE COMMITTEE
ON DISINFECTANTS OF THE
AMERICAN PUBLIC HEALTH
ASSOCIATION.

THE following extract from a report of the Committee on Disinfectants of the American Public Health Association, clearly conveys the distinction between disinfectants, deodorants and antiseptics. It is an exposition of what we may term the latest sanitary gospel, and abounds in practical suggestions, the value of which at the present time, in view of the possible invasion of this country by cholera in the near future, can not be over-estimated.

OBJECT OF DISINFECTION.

The object of *disinfection* is to prevent the extension of infectious diseases by destroying the specific infectious material which gives rise to them. This is accomplished by the use of disinfectants.

There can be no partial disinfection of such material ; either its infecting power is destroyed or it is not. In the latter case there is a failure to disinfect. Nor can there be any disinfection in the absence of infectious material.

It has been proved for several kinds of infectious material that its specific infecting power is due to the presence of living micro-organisms, known in a general way as 'disease germs ;' and practical sanitation is now based upon the belief that the infecting agents in all kinds of infectious material are of this nature. Disinfection, therefore, consists essentially in the destruction of disease germs.

Popularly, the term disinfection is used in a much broader sense. Any chemical agent which destroys or masks bad odors, or which arrests putrefactive decomposition, is spoken of as a disinfectant. And in the absence of any infectious disease it is common to speak of disinfecting a foul cess-pool, or bad-smelling stable, or privy vault.

This popular use of the term has led to much misapprehension, and the agents which have been found to destroy bad odors—*deodorizers*—or to arrest putrefactive decomposition—*antiseptics*—have been confidently recommended and extensively used for the destruction of disease germs in the excreta of patients with cholera, typhoid fever, etc.

The injurious consequences which are likely to result from such misapprehension and misuse of the word disinfectant will be appreciated when it is known that recent researches have demonstrated that many of the agents which have been found useful as deodorizers, or as antiseptics, are entirely without value for the destruction of disease germs.

This is true, for example, as regards the sulphate of iron or copperas, a salt which has been extensively used with the idea that it is a valuable disinfectant. As a matter of fact, sulphate of iron in saturated solution does not destroy the vitality of disease germs, or the infecting power of material containing them. This salt is, nevertheless, a very valuable antiseptic, and its low price makes it one of the most available agents for the arrest of putrefactive decomposition in privy-vaults, etc.

Antiseptic agents also exercise a restraining influence upon the development of disease germs, and their use during epidemics is to be recommended, when masses of organic material in the vicinity of human habitations cannot be completely destroyed, or removed, or disinfected.

While an antiseptic agent is not necessarily a disinfectant, all disinfectants are antiseptics ; for putrefactive decomposition is due to the development of a 'germ' of the same class as that to which disease germs belong, and the agents which destroy the latter also destroy the bacteria of putrefaction, when brought in contact with them in sufficient quantity, or restrain their development when present in smaller amounts.

A large number of the proprietary 'disinfectants,' so-called, which are in the market, are simply deodorizers or antiseptics, of greater or less value, and are entirely untrustworthy for disinfecting purposes.

Antiseptics are to be used at all times when it is impracticable to remove filth from the vicinity of human habitations, but they are a poor substitute for cleanliness.

During the prevalence of epidemic diseases, such as yellow fever, typhoid fever, and cholera, it is better to use, in privy-vaults, cess-pools, etc., those antiseptics which are also disinfectants—*i. e.*, germicides ; and when the contents of such receptacles are known to be infected this becomes imperative.

Still more important is the destruction at our seaport quarantine stations of infectious material which had its origin outside of the boundaries of the country, and the destruction, within our boundaries, of infectious material given off from the persons of those attacked with any infectious disease, whether imported or of indigenous origin.

In the sick-room we have disease germs at an advantage, for we know where to find them as well as how to kill them.

Having this knowledge, not to apply it would be criminal negligence, for our efforts to restrict the extension of infectious diseases must depend largely upon the proper use of disinfectants in the sick-room."

WHAT DISINFECTANTS ARE OF THE MOST VALUE? *

THAT depends on the immediate object to be accomplished. Recent experiments have shown that among the most efficient of all true disinfectants, we must rank corrosive sublimate. But this is poisonous to the higher animals, and cannot, therefore, have universal application. For disinfecting excrementitious products, it must be considered the best agent we have, and it can be employed also in treating articles of clothing, etc., which should also be boiled before they are again used. Potassium permanganate, which is far less poisonous, is useful, especially from its deodorizing power. These may be combined for use in the sick room. While these various substances can be employed in the form of a spray, and thus diffused through an apartment, they should be replaced in many cases by gaseous agents, which can more readily pursue the disease germs floating in the air. Of gaseous disinfectants, we may choose between sulphurous acid, chlorine, and bromine, and to this list may be added also iodine. The results of recent researches prove that, of the agents available from their cheapness as disinfectants, corrosive sublimate, permanganate of potassium, chlorine, bromine, and perhaps the chloride of zinc, are the only ones having sufficient germicidal power to be worthy of consideration. The following table from Miquel (*Bied. Centr.*) shows the comparative value of a few of the most important antiseptics. The figures give the amount of the compound which was required to preserve 1000 c. c. of beef tea:

	GRMS.
Mercuric iodide	0.025
Silver iodide	0.03
Hydrogen peroxide	0.05

* Excerpt from a Monograph by Prof. A. B. Lyons, M.D.

	GRMS.
Mercuric chloride (corrosive sublimate).....	0.07
Silver nitrate.....	0.03
Osmic acid.....	0.15
Chromic acid.....	0.20
Iodine.....	0.25
Chlorine (gaseous).....	0.25
Hydrocyanic acid.....	0.40
Bromine.....	0.60
Chloroform.....	0.80
Copper sulphate.....	0.90
Salicylic acid.....	1.00
Benzoic acid.....	1.10
Potas. chromate.....	1.30
Picric acid	1.30
Lead chloride.....	2.10
Mineral acids.....	2.00-3.00
Essence bitter almonds.....	3.20
Phenol	3.20
Potas. permanganate.....	3.50
Aniline.....	4.00
Alum	4.50
Tannin.....	4.80
Arsenious acid	6.00
Boracic acid	7.50
Chloral hydrate.....	9.00
Ferrous sulphate (copperas).....	11.00
Amyl alcohol.....	14.00
Ethyl sulphide.....	22.00
Borax.....	70.00
Ethyl alcohol.....	95.00
Potas. thiocyanate (sulphocyanide).....	120.00

	GRMS.
Potas, iodide	140.00
Potas, cyanide	185.00
Sodium thiosulphate (hyposulphite).	275.00

PRINCIPLES TO BE REGARDED IN THE USE OF ANTISEPTICS AND DISINFECTANTS.

1. We may seek to prevent the disease germs from finding lodgment where they can multiply or long retain life. To this end, houses, and especially hospitals and pest-houses, must be thoroughly *ventilated*. Scatter these germs where there is plenty of light and air, and they become harmless ; in damp, dark spots they retain their vitality a long time, but sunlight, thorough desiccation, and the oxidizing action of the air, will speedily destroy them. There must be no neglected places about our cellars or basements where they can hide themselves and thrive and multiply. Every part of the house, and, most of all, the drains, privy vaults, etc., whose function is to aid us in disposing of refuse material, must be kept scrupulously clean. In the instructions issued by the American National Board of Health, these points are emphasized and reiterated : “ *Disinfection cannot compensate for want of cleanliness nor of ventilation.* ” The most available agents in combating infectious diseases are fresh air and cleanliness.”

2. We may endeavor to prevent the propagation of these germs by sterilizing the soil on which they fall. Accumulations of refuse matter cannot be altogether avoided, but we can, by the free use of *antiseptics*, keep them in such a condition that spores will not readily germinate in them. It is well-known that decomposing organic matter affords the most favorable possible soil for the growth of the lower forms of vegetable and animal organ-

isms. While foul odors are not, in themselves, an evidence of the presence of contagion, they warn us that there is danger, and we shall do well to heed the warning.

3. We may attack the germs themselves, and endeavor to lower or destroy their vitality. This is what we seek to accomplish by the use of *disinfectants*; but the germs are organisms of a very low grade of life, and are therefore not easy to kill. The study of the various disinfectants, with especial reference to their relative value in different diseases, or under different circumstances, therefore becomes an important one. So, also, is it essential to know the best means and modes of using them.

WHEN AND WHERE DISINFECTANTS SHOULD BE USED.

We must not expect that the use of a little chlorinated lime or carbolic acid will have a magic influence to ward off danger. For the complete disinfection of an apartment in which there has been a case of infectious disease, it is necessary to fill the room completely with an atmosphere of sulphurous acid, chlorine, bromine, or hyponitric acid, and keep it several hours shut up, until every crevice is thoroughly penetrated and permeated with the disinfectant. But this thorough use of disinfectants is only admissible for the prevention of contagion after the recovery or death of the patient.

GENERAL DIRECTIONS REGARDING DISINFECTION.

IN the report of the Committee on Disinfectants of the American Public Health Association, previously alluded to, appear the following general directions regarding disinfection :

DISINFECTION OF EXCRETA, ETC.

The infectious character of the dejections of patients suffering from cholera and from typhoid fever is well established; and this is true of mild cases and of the earliest stages of these diseases as well as of severe and fatal cases. It is probable that epidemic dysentery, tuberculosis, and perhaps diphtheria, yellow fever, scarlet fever, and typhus fever may also be transmitted by means of the alvine discharges of the sick. It is therefore of the first importance that these should be disinfected. In cholera, diphtheria, yellow fever, and scarlet fever, all vomited material should also be looked upon as infectious. And in tuberculosis diphtheria, scarlet fever, and infectious pneumonia, the sputa of the sick should be disinfected. It seems advisable also to treat the urine of patients sick with an infectious disease with a disinfecting solution.

DISINFECTION OF THE PERSON.

The surface of the body of a sick person, or of his attendants, when soiled with infectious discharges, should be at once cleansed with a suitable disinfecting agent. For this purpose "Labarraque's Solution," * diluted with five times its volume of water, may be used. After carefully washing soiled surfaces with this solution, the disinfectant itself is to be washed away with a towel wet with water or with diluted alcohol, one part to ten. The surface of the dead may be disinfected by the use of the same solution, and cloths wet with this solution should be placed over orifices from which infectious material is likely to escape.

In diseases like small pox and scarlet fever, in which the infectious agent is given off from the entire surface of the body occasional ablutions with Labarraque's Solution diluted with twenty parts of water will be required.

* A solution of Chlorinated Soda.

In all infectious diseases the surface of the body of the dead should be thoroughly washed with a suitable solution and then enveloped in a sheet saturated with the same.

DISINFECTION OF CLOTHING.

Boiling for half an hour will destroy the vitality of all known disease germs, and there is no better way of disinfecting clothing and bedding which can be washed than to put it through the ordinary operations of the laundry. No delay should occur, however, between the time of removing soiled clothing from the person or bed of the sick and its immersion into boiling water. If circumstances make it impracticable to do this at once, clothing should be immersed in a suitable disinfecting fluid.

The articles to be disinfected must be thoroughly soaked with the disinfecting solution, and left in at least two hours, after which they may be wrung out and sent to the wash.

Clothing and bedding which cannot be washed may be disinfected by exposure to dry heat in a properly constructed disinfecting chamber for three or four hours. A temperature of 230 F. should be maintained during this time, and the clothing must be freely exposed—i. e., not folded or arranged in piles or bundles, for the penetrating power of dry heat is very slight.

The temperature above mentioned will not destroy the *spores* of bacilli—e. g., of the anthrax bacillus, but is effective for the destruction of all disease germs which do not form spores; and there is good reason to believe that this list includes smallpox, cholera, yellow fever, diphtheria, erysipelas, puerperal fever, and scarlet fever (?) Moist heat is more effective, and it is demonstrated that ten minutes' exposure to steam, at a temperature of 230 F. will destroy all known disease germs, including the most refractory spores.

In the absence of a suitable disinfecting chamber it will be necessary to burn infected clothing and bedding, the value of which would be destroyed by immersion in boiling water, or in a suitable disinfecting solution.

DISINFECTION OF THE SICK ROOM.

In the sick-room no disinfectant can take the place of free ventilation and cleanliness. It is an axiom in sanitary science that *it is impracticable to disinfect an occupied apartment*; for the reason that disease germs are not destroyed by the presence in the atmosphere of any known disinfectant in respirable quantity. Bad odors may be neutralized, but this does not constitute disinfection in the sense in which the term is here used. These bad odors are, for the most part, an indication of want of cleanliness, or of proper ventilation; and it is better to turn contaminated air out of the window, or up the chimney, than to attempt to purify it by the use of volatile chemical agents, such as carbolic acid, chlorine, etc., which are all more or less offensive to the sick, and are useless so far as disinfection—properly so-called—is concerned.

When an apartment which has been occupied by a person sick with an infectious disease is vacated, it should be disinfected. But it is hardly worth while to attempt to disinfect the atmosphere of such an apartment, for this will escape through an open window and be replaced by fresh air from without, while preparations are being made to disinfect it. Moreover, experience shows that the infecting power of such an atmosphere is quickly lost by dilution, or by the destruction of floating disease germs through contact with oxygen, and that even small-pox and scarlet fever are not transmitted to any great distance through the atmosphere; while cholera, typhoid fever, and yellow fever are rarely, if ever, contracted by contact with the sick, or by respiring the atmosphere of the apartments occupied by them.

The object of disinfection in the sick-room is, mainly, the destruction of infectious material attached to surfaces, or deposited as dust upon window-ledges, in crevices, etc. If the room has been properly cleansed and ventilated while still occupied by the sick person, and especially if it was stripped of carpets and unnecessary furniture at the outset of his attack, the difficulties of disinfection will be greatly reduced.

All surfaces should be thoroughly washed with a solution of corrosive sublimate of the strength of one part in 1000 parts of water. The walls and ceiling, if plastered, should be whitewashed with a lime wash containing the same proportion of corrosive sublimate, or they may be brushed over with the aqueous solution. Especial care must be taken to wash away all dust from window-ledges or other places where it may have settled, and to cleanse thoroughly crevices and out-of-the-way places. After this application of the disinfecting solution, and an interval of twenty-four hours or longer for free ventilation, the floors and woodwork should be well scrubbed with soap and hot water, and this should be followed by a second more prolonged exposure to fresh air, admitted through open doors and windows.

Many sanitary authorities consider it necessary to insist upon fumigation with sulphurous acid gas—produced by combustion of sulphur—for the disinfection of the sick-room. As an additional precaution this is to be recommended, especially for rooms which have been occupied by patients with small-pox, scarlet fever, diphtheria, typhus fever, and yellow fever. It should precede the washing of surfaces and free ventilation above recommended. But fumigation with sulphurous acid gas alone, as commonly practised, cannot be relied upon for the disinfection of the sick-room and its contents, including bedding, furniture, infected clothing, etc., as is popularly believed. And a misplaced confidence in this mode of disinfection is likely to lead to a neglect of

the more important measures which have been recommended. In the absence of moisture the disinfecting power of sulphurous acid gas is very limited, and under no circumstances can it be relied upon for the destruction of spores. But exposure to this agent in sufficient quantity, and for a considerable time, especially in the presence of moisture, is destructive of disease germs, in the absence of spores. It is essential, however, that the germs to be destroyed shall be very freely exposed to the disinfecting agent, which has but slight penetrating power.

To secure any results of value it will be necessary to close the apartment to be disinfected as completely as possible by stopping all apertures through which the gas might escape, and to burn not less than three pounds of sulphur for each thousand cubic feet of air-space in the room. To secure complete combustion of the sulphur it should be placed, in powder or in small fragments, in a shallow iron pan, which should be set upon a couple of bricks in a tub partly filled with water, to guard against fire.*

The sulphur should be thoroughly moistened with alcohol before igniting it.

DISINFECTION OF PRIVY-VAULTS, CESS-POOLS, ETC.

When the excreta—not previously disinfected—of patients with cholera or typhoid fever, have been thrown into a privy-vault this is infected, and disinfection should be resorted to as soon as the fact is discovered, or whenever there is reasonable suspicion that such is the case. Disinfection may be accomplished either with corrosive sublimate, or with chloride of lime. The amount used must be proportioned to the amount of material to be disinfected.

*One litre of sulphur dioxide weighs 2.9 grammes. To obtain ten litres of gas it is necessary to burn completely fifteen grammes of "flowers of sulphur" (Valin).

Use one pound of corrosive sublimate for every five hundred pounds—estimated—of fecal matter contained in the vault, or one pound of chloride of lime to every thirty pounds.

All exposed portions of the vault, and the wood-work above it should be thoroughly washed down with a disinfecting solution.

DISINFECTION OF INGESTA (FOOD, DRINK, ETC.)

It is well established that cholera and typhoid fever are very frequently, and perhaps usually, transmitted through the medium of infected water and articles of food, and especially milk. Fortunately we have a simple means at hand for disinfecting such infected fluids. This consists in the application of heat. The boiling temperature maintained for half an hour kills all known disease germs. So far as the germs of cholera, yellow fever, and diphtheria are concerned, there is good reason to believe that a temperature considerably below the boiling point of water will destroy them. But, in order to keep on the safe side, it is best not to trust anything short of the boiling point (212° F.) when the object in view is to disinfect food or drink which is open to the suspicion of containing the germs of any infectious disease.

During the prevalence of an epidemic of cholera it is well to boil all water for drinking purposes. After boiling, the water may be filtered, if necessary to remove sediment, and then cooled with *pure* ice, if desired.

A sheet of filtering paper, such as druggists use, and a glass or tin funnel, furnish the best means for filtering water on a small scale for drinking purposes. A fresh sheet of paper is to be used each day.

FUTILITY OF MEANS OF DISINFECTION OFTEN EMPLOYED.

Methods of disinfection are often resorted to, not infrequently, is to be regretted, at the suggestion of medical and sanitary

authorities, which have been shown by recent experiment to be entirely useless, and indeed, worse than useless, since they inspire false confidence in means which utterly fail to accomplish the result desired.

Thus the practice of suspending in the sick-room cloths which have been immersed in some much-vaunted proprietary disinfectant, in carbolic acid, in solutions of chlorine, bromide, etc., does not in any degree destroy the disease germs present, since these germs can not be destroyed by any known chemical agent infused into the atmosphere in such quantity as to permit of the atmosphere still being respired—or, as Dr. Sternberg in a paper previously alluded to expresses it: "*Disinfection of the atmosphere of an occupied apartment is entirely impracticable, because the inmates would be suffocated by any effective volatile germicide agent before germs present in the atmosphere could be destroyed.*"

UTILITY OF DEODORANTS AND ANTI-SEPTICS.

THE danger of using a deodorant to accomplish the work of a disinfectant, we believe has been made sufficiently clear.

One would be greatly in error, however, to deduce from this fact the conclusion that deodorants and antisepsics serve no useful purpose. On the contrary their utility is second only to that of the disinfectants themselves. For while our first aim must be to kill the germs which propagate disease, the accomplishment of this purpose does not necessarily insure the destruction of the odor inseparable from the decay of organic matter.

While, therefore, we should see to it that no effort is spared to destroy the germs, having rendered these innocuous it should also be our care to mask or neutralize by deodorants the disagree-

able smells that are inseparable from the existence of those portions of the home which are designed to be the receptacles of the waste, the refuse, the excreta.

The sink, the drain, the vault, therefore, claim the systematic attention of those who would keep the sanitary surroundings of their homes perfect—and deodorants should be used with an unsparing hand.

It will not infrequently also be impracticable to remove or thoroughly destroy accumulations of organic material which form a nidus for the development of disease germs. In such cases it is essential that the process of putrefaction be arrested by antiseptics and the effluvia arising from decomposing matter be rendered odorless.

NEEDLESSNESS OF THE FEAR OF CHOLERA.

WHILE it would be in the highest degree imprudent to advise the public to neglect any reasonable sanitary precaution or abate their efforts to render their persons, their food and drink, their homes and general surroundings as absolutely free from sources of contamination with infectious material as cleanliness, disinfectants, deodorants and antiseptics can make them, it would at the same time be unwise to instil a needless fear of an epidemic of cholera.

While the newspapers are, as is their duty, sounding the alarm and warning against the dangers of this dread scourge, it is well to look also at the conservative side of the subject.

In the discussion following a recent lecture on cholera in Boston it was asserted by one of the speakers that, in his belief, during an epidemic of cholera, more persons died from *fright* than from cholera. As illustrative of his belief he related a story about the Plague meeting an angel when crossing the desert. To the ques-

tion of where he was going, the Plague replied that he was going to kill 5,000 persons. Some time later these two met again. The angel said, "You told me you were only going to kill 5,000 persons, but 10,000 have died." To this the Plague replied, "I did only kill 5,000; the other 5,000 died of fright."

The story is indicative of an undoubted fact, viz., that at all times, and especially during the prevalence of an epidemic, fear is an important factor in predisposing to the disease and increasing the susceptibility to its ravages.

The *N.Y. Medical Record* in a recent number editorially comments on this subject as follows :

"It will be found during the coming spring that the prospect even of an epidemic of cholera works considerable harm. The agitation over the subject has aroused the people, and has not only stimulated health officials but has infused among the people a very wide-spread fear of the expected disease. Indeed, there is in many nervous persons an almost panicky condition of mind, while even the most intelligent have an exaggerated view of the direful possibilities which the coming season holds out. The result is that nearly all the families which usually leave the city in the summer are now planning to leave it much earlier than is customary.

"We have felt it to be the wisest plan, and, indeed, our bounden duty, to urge as strongly as possible the need of setting on foot the most thorough preventive measures against cholera. To spend money to keep out the disease is by far the cheapest and most humane plan. If, now, the disease does not come, at least duty will have been done, and the people will have received some useful lessons in sanitation.

"It should be understood, however, that the probability of there being any extensive outbreaks of cholera in this country, during the coming year, is small, while the probability of any but sporadic cases appearing in this city is very remote indeed. The

cholera is now in the third year of its travels from India, and its virulence is waning. This was shown by the small extent of its ravages in Paris last fall.

"There is absolutely no need for alarm or of early decampments into cold and unsalubrious summer hotels. It is necessary to repeat, also, the statement that cholera is not a contagious disease like scarlet fever and measles. Its presence in cities of India, where it is endemic, creates no more alarm or comment than does the presence of diphtheria with us."

HOW TO KEEP INFECTIOUS DISEASES FROM SCHOOLS.

THE *N. Y. Medical Record* also, *a propos* of a pamphlet entitled "Code of Rules for the Prevention of Infectious and Contagious Diseases in Schools," makes some pertinent suggestions with extracts from the book in question, which we introduce in the belief that the information conveyed may be acceptable to the reader :

"There is yet considerable diversity of opinion as to what measures are best and most practicable for keeping the infectious eruptive fevers from schools. The problem differs necessarily in accordance with the location of the school, whether in city or town, and its character, whether public or private. It has been the experience of physicians that measles, scarlet fever, diphtheria, and pertussis will appear among school-children despite the greatest precautions. And the public is not yet educated up to the point when it will co-operate heartily and intelligently with health officers, or second them in still more stringent efforts at prevention. We must, therefore, continue making slow improvements, and learning by experience what are the best modes to check infection without using methods too intricate and burdensome.

"A step in this direction was made recently in the attempt to instruct teachers in the early symptoms of the eruptive fevers and other contagious maladies.

"According to the 'Code' before us, which is intended chiefly for private institutions, every large school should have a detached infirmary, and, where possible, a separate building for infectious diseases. In small schools there should be a 'sick-room' at the top of the house."

DURATION OF ISOLATION AFTER EXPOSURE TO CONTAGIOUS DISEASES.

The following quarantine times after exposure to infection are considered safe, provided thorough disinfection be carried out on the pupil's return to school : Diphtheria, twelve days' quarantine ; scarlet fever, fourteen ; measles, sixteen ; German measles (Rotheln, or epidemic roseola), sixteen ; chicken-pox, eighteen ; small-pox, eighteen ; mumps, twenty-four ; whooping-cough, twenty-one.

With regard to that most important question, "When may a pupil who has an infectious disease go home, or rejoin the school ? the following rules are endorsed, provided patient and clothes are thoroughly disinfected, "A pupil may go home, or rejoin the school, after scarlet fever, in not less than six weeks from the date of the rash, if desquamation have completely ceased, and there be no appearance of sore throat ; measles, in not less than three weeks from the date of the rash, if all desquamation and cough have ceased ; German measles (Rotheln, or epidemic roseola), in two or three weeks, the exact time depending upon the nature of the attack ; small-pox and chicken-pox, when every scab has fallen off ; mumps, in four weeks from the commencement, if the swelling has subsided ; whooping-cough, after six weeks from the commencement of the whooping, provided the characteristic spasmodic

cough and the whooping have ceased, or earlier, if all cough has completely passed away; diphtheria, in not less than three weeks, when convalescence is completed, there being no longer any form of sore throat, or any kind of discharge from the throat, nose, eyes ears, etc., and no albuminuria."

In conclusion, it may be said that such means as quarantine, disinfection, etc., cannot supply the place of thorough cleanliness, and abundance of fresh air, though it must be admitted that the frequent lack of enforcement of the one, and the absence of the other, make the resort to disinfectants, deodorants, and antiseptics a *sine qua non* to the prevention of disease and the maintenance of health.



USE OF THE "RED-CROSS OZONIZED FLUID."

[Being highly concentrated this Fluid should always be diluted with from 100 to 200 times its bulk of water: Say a wineglassful of fluid to a pail of water, or a teaspoonful to a pint of water. For convenience the fluid so diluted is called *Dilute Fluid*. In the following directions for its use.]

1. To Prevent Spread of Infectious Diseases.— Remove from the sick room all bed and window curtains, and carpets. Hang across the room door, so as to form a screen, a sheet or blanket, which moisten freely and often with *dilute fluid*, by spraying or otherwise. Place underneath the bed, and in other convenient parts of the room, basins or dishes containing *dilute fluid*. Keep within reach of the patient a vessel similarly charged for him to spit into when he so requires. Have close at hand a pail, which should be of metal and not of wood, half full of *dilute fluid*, wherein immediately to throw bed-clothes and other articles removed from the patient. After emptying chamber utensils or night-pans, and before replacing them, throw into them one or two teacupfuls of *dilute fluid*. Use *dilute fluid* instead of plain water for sponging the hands, face, and other parts of the patient's body, when that is permitted, taking care that the sponge be clean, and that no soap be employed.

2. To Purify and Maintain in a state of Purity the air of Apartments, Bed-chambers, School-rooms, Workshops, Cabins and Bunks on Board Ships, Hospital Wards, Sick Rooms, &c.—Place in convenient situations dishes or basins containing *dilute fluid*, changing the contents when the pink color has disappeared; hang up cloths, such as old sheets or counterpanes, kept moist by sprinkling with same; exhale, from time to time, into the air by means of a

"spray producer." To all water used for cleansing, scrubbing, and watering the floor, and especially to that with which water-closets and night-pans are swilled and flushed, add an equal quantity of *dilute fluid*.

3. To purify Stables, Cow-houses, Dog-kennels, Slaughter-houses, Butchers' Shops, Dairies, Larders.

—Measures similar to above, or such of them as are applicable, will suffice to keep in a state of purity these and all other places wherein the air is liable to pollution. Should offensive matter be present, sprinkle *dilute fluid* by hand or by means of a watering can having a finely perforated rose, over the floors and walls.

4. To render Safe Infected Clothing, Bedding, &c.

—Linen and such other articles as admit of washing, on being removed from the patient, should be plunged for twenty-four hours in a tub of *dilute fluid*. After this they can be boiled and washed with safety.

5. To Cleanse Wounds, Ulcers, Cancers, &c.—Wash, syringe, or spray the affected parts with *dilute fluid*. Sponges used in the operation ought to be previously well washed in *dilute fluid*.

6. To keep Dust-bins Sweet and Wholesome.—Sprinkle once a day, and oftener in summer, the contents with *dilute fluid* by means of a watering-pot having a finely perforated rose; during and after the removal of the dust, sprinkle the bin with same.

7. To Disinfect Water-closets, Bed-pans, Urinals, Drains, Sinks, &c.—Pour all round the surface a sufficient quantity of *dilute fluid*, scrubbing the while with a clean, hard brush. Some fluid double the strength of the *dilute fluid* should be put into night-chairs and bed-pans previous to use. Urinals, when well scrubbed and swilled once a day with fluid diluted,

never smell offensively. A convenient plan is to syringe the surfaces once or twice a day with *dilute fluid* by means of a common garden syringe. Drains and sinks should be copiously flushed with plenty of water, and lastly with *dilute fluid*. The disgusting smell of cabbage water, which so rapidly pervades a whole house, is prevented by adding a few drops of fluid to the water before pouring it down the sink. Water-closets can be rendered safe and inodorous by conveying into the pan each time the closet is used, a very minute quantity of fluid.

8. To Disinfect Cesspools and Privies.—Mix a quarter of a pint of undiluted fluid with six gallons of water; thoroughly wash the walls of the cesspool, and cover the surface of the soil with the mixture.

9. To Sweeten Musty Barrels, Dairy Utensils, Pickling-tubs, Slop-pails, Bottles, &c.—Rinse well with *dilute fluid*; when convenient, allow some to remain in them for a few hours, and then rinse again. In the case of bottles, the *dilute fluid* may be used with shot.

10 To prevent Blight, Smut, Rust, "Spot," &c., in Plants.—Use *dilute fluid* for watering. "Spray" with *undiluted fluid* the plants themselves when affected.

11. To Test Water for Putrescent Organic Matter.—Add to a tumbler full of water to be examined one or two drops of Fluid *undiluted*, which will give it a very faint pink hue. If, after standing three or four hours, the pink color has gone, or turned to yellowish, the water is tainted, and cannot be used safely in the state in which it is. If, on the contrary, the pink hue maintains itself, the water may be used with safety.

12. To render Impure Water Sweet and Safe to Drink, and to ensure Purity in Cisterns, Tanks, &c.

(*Ozonized Fluid is innocuous to drink, even when strong, and entirely free from taste or smell. It is the only agent known that decomposes and renders harmless all putrid organic matters in water, whether they be in solution, and therefore inseparable by filtration, or in suspension.*) For every fifty gallons of water, pour into the cistern, water-butt or ship's tank, one wineglassful of Fluid *undiluted*. Stir thoroughly with a stick, and allow to stand several hours or overnight. Unless the water be very foul, this quantity of Fluid will suffice to render it perfectly sweet. If a very faint pink tinge remains some time longer in the water, all organic impurities are proved to be neutralised. Should, however, the pink color disappear after standing overnight, the water is still impure, and a second dose of Ozonized Fluid must be stirred in. The decomposed impurities, which combine with the Fluid, and form harmless insoluble flocculent particles, may then be allowed to settle till the water is clear, or the water may be filtered.

13. To Enhance the Purifying and Invigorating effect of Baths, Tubs, &c.—Effects of a most refreshing and invigorating character—resembling in many respects those produced on the body by pure country air—are obtained by use of the Fluid in the bath. All offensive secretions of the skin are neutralized. Through the influence exerted on the nerves and vessels of the skin by the ozonic oxygen, the tone and vigor of the system are materially improved. Being quite compatible with sea-water, Ozonized Fluid forms a most useful addition to sea-salt baths. Young children are particularly benefited by its use.

Entire Baths.—Throw in a wine glassful of the Fluid, *undiluted*, previous to entering the bath, and stir till it is well diffused. As the pink color vanishes, whilst the bather is in the bath, let more fluid be added.

Tubs and Foot-baths.—One tablespoonful of *undiluted fluid* to every two gallons of water.

N. B.—Care must be taken not to introduce soap into the water, and not to use any till towards the end of the bathing. Sponges should be previously purified by washing in *dilute fluid*.

14. The Ozone-bleach for Linen, Cotton, Flannel, Sponges, &c.—To half a gallon of water add one wineglassful of Ozonized Fluid. In this soak the articles for about an hour. On drying they will be found to be of a pale fawn color. Then steep them in a solution of 2 ounces of salt of sorrel (or of one teaspoonful of aqueous sulphurous acid) to half a gallon of water. The articles will become of a snowy whiteness, this process of ozone bleaching being identical with that which obtains in the bleach-field.

15. To remove Stains accidentally made by using Ozonized Fluid too strong.—Linen, cotton, &c., should be steeped overnight in a solution of one ounce of salt of sorrel to the pint of water. Stains on the hands are easily removed by rubbing with a slice of lemon.



Disinfectants & Antiseptics.

The important difference between a DISINFECTANT and an ANTISEPTIC agent is one which should be generally noted.

A *Disinfectant*, as its name implies, should destroy, decompose, and render inert, infectious matter. To this class belong fresh air, the action of fire, chlorine gas, and Ozonized Fluid. An *Antiseptic* is the opposite to a disinfectant, and merely preserves or pickles, and does not destroy infectious matter. Common salt (brine), vinegar, sugar, astringents, carbolic acid, tar, turpentine, benzine, &c., are antiseptics, and though they prevent putrefaction setting in, they are incapable of altering infectious matter when once present, and so fall short of the requirements of sanitation. Dr. Dougall found that the infective power of vaccine matter was unimpaired after treatment with carbolic acid, and the familiar illustration of tainted meat preserving its taint, though steeped for years in antiseptic brine, proves that the effect of antiseptics is to preserve organic matter in its original state of foulness or of freshness, but not to destroy putrid or infectious matter as disinfectants do.

THE RED CROSS OZONIZED FLUID, besides being a powerful Disinfectant, possesses, moreover, important antiseptic properties.

FOR SALE BY ALL DRUGGISTS.

AGENTS FOR CANADA :

KENNETH CAMPBELL & CO., MONTREAL.